

MUNICIPAL JOURNAL AND ENGINEER

VOLUME XX

NEW YORK, JANUARY 31, 1906

No. 5

CONCRETE WORK IN FREEZING WEATHER*

The Use of Salt, Particularly in Sidewalk Construction

THE fact that it is often necessary to do concrete work in freezing weather makes it desirable to be able to lay and care for the work in such a manner that it may not be damaged by frost. The foundation should be porous and as well drained as possible, as freezing during the first twenty-four hours after the walk is laid is liable to expand the ground, which will crack the walk before the hard setting takes place. The use of what salt can be dissolved in the mixing water will prevent the walk from being scaled or cracked by the frost expanding the concrete.

Should the sand and gravel be very wet, salt should be spread on the batches with the cement, so as to be mixed with the sand and gravel, the same as the cement. In case this is done the mixing should be continued considerably longer, so as to dissolve the salt as much as possible before wetting. After the wetting, the batches should be turned once or twice extra, as prolonged mixing increases the strength of the work.

In cool or freezing weather only water enough should be used in wetting to enable the work to be floated and troweled; it should be covered very quickly after the concrete is placed in the moulds. The setting takes place more slowly in low temperatures, but sidewalks can be given to the public for use from one to four days sooner when salt is used.

The safest manner of caring for the walk during the hardening is to cover with sawdust, planer shavings or earth, and over this to lay canvas or other covering, with the object of keeping the walk as dry as possible; this will hasten the hardening and prevent the frost from expanding the ground under the walk. I have laid walks as late as December 20th, and in the past season about 9,000 square feet after November 1st. I use about 10 per cent. more cement in cool or frosty weather to insure strong work. Walks in which I have used salt during the last seven years are fully as satisfactory as those laid without salt.

As to the effect of salt on sidewalks, there may be a difference of opinion among concrete experts, but there is

a general agreement that, if properly used, it will assist in preventing injury by frost; if there are any injurious effects there are also decided benefits in its leaving the walks in a much better condition than they would be without it. Most tests are tensile and laboratory tests, and the briquettes are not usually stored on the ground as sidewalks are laid and therefore do not show the effects of different atmospheric and weather conditions on the concrete. Some instructive tests have, however, been made by engineers in charge of Government and other work.

In December, 1904, I moulded about seventy-five 3-inch cubes in half of which about 15 per cent. of salt was used for the purpose of determining the effect of salt under different atmospheric conditions. Those made with salt water were stored the same as those made with fresh water. Half of them were placed in the open air, on the ground, before the initial set, the temperature of the air being about 10° above zero. Of course, those made with fresh water were frozen solid, but those mixed with salt water showed no effects of frost when the temperature was 10° above zero, except that the hardening set was very slow. The other half were hardened, and stored in a damp cellar on the ground until packed for shipment.

The cubes were all carefully packed, marked and shipped to the Case School of Applied Science, Cleveland, O., December 15, 1905. I was assisted by two of the '06 engineering class in breaking the cubes. The records of the breaking of the cubes have been tabulated, the results being summarized as follows:

Of those stored in the cellar, there was but little difference between those made with fresh or salt water. But in those stored in the open air there was a difference of about 50 per cent. in favor of the salt-water briquettes. The most surprising feature was that those made with salt water and stored on the ground out doors were about 22 per cent. stronger than those made with salt and fresh water and stored in the cellar.

As all other conditions were equal, the place of storage and the atmospheric conditions were the only influences which could make the differences in the breakings.

The conclusions to be drawn from these tests are that 15 per cent. of salt can be used in the mixing water without injurious effect on concrete three inches thick and

* Paper read before the National Association of Cement Users at its Second Annual Convention, held at Milwaukee, Wis., January 9-12, by George A. Stanley, Member of the Committee on Streets, Sidewalks, and Floors.

placed on the ground; that salt will prevent injury to concrete by frost at temperatures about 10° above zero; that concrete without salt in the mixing water will be more or less injured by frost if laid in freezing weather, and that if there is no frost in the material used and properly cared for, concrete walks can be laid in freezing weather and be strong and durable.

The Cost of Public Service

GOVERNOR JOHN A. JOHNSON, of Minnesota, in an address to the Commercial and Municipal League, at St. Paul, on January 10, thus referred to the question of municipal service and the value of public franchises:—

"The people will be called upon at the next general election to vote upon a proposed amendment to the constitution, giving the Legislature wider latitude in tax legislation, and I hope you will each do your share to secure the adoption of this amendment.

"I have no desire to discuss these several questions in detail. Many of them are abstract and not concrete. There are a few questions, however, which ought to be discussed perhaps at greater length and more in detail. The question of municipal ownership is one which is spreading over the country as a prairie fire. The wisdom of municipalities controlling their own public service utilities is certainly one of direct and vital concern to you and to your people.

"I cannot let this opportunity pass without the remark that the people of a municipality are entitled to their water, their light, and kindred other service at the cost of that service.

"A city controlling the streets and other highways which has the right to confer a chartered privilege upon private individuals to control these utilities ought to bear in mind that, as a purely business proposition, it is wise and prudent that they control their own public service utilities. Students of economics have proved conclusively that the service to the people is always better and supplied at a lesser cost when supplied by the city direct than when supplied by private individuals under a chartered or corporation right, and every city should think well before it parts with these great privileges."

Civic Administration in Newport, R. I.

MAYOR COTTRELL, of Newport, R. I., in his first inaugural address, reviews local conditions at considerable length and recommends certain improvements in the several departments. He emphasizes the need for careful revision of Newport's charter, as suggested by his predecessor, and lays special stress upon the advisability, so far as practical, of permanency in the tenure of municipal office. The following extract is typical of this excellent address:—

"I desire to quote my predecessor on this subject. 'An early revision of the city charter is essential to the economical and business-like administration of the city affairs. Many of its provisions have become antiquated and now operate adversely to the city's interests. I shall

not presume to anticipate what the city charter should be, but it seems to me that the present system of electing city officers for one year has nothing to commend its continuance and that the city charter should be so modified as to embody, as far as practicable, permanency in the tenure of office. Also that the Mayor should have the veto power as a check upon hasty and ill-considered action of the City Council; that he should have discretionary and disciplinary powers over the heads of departments and should be held responsible for the proper discharge of their duties.

"Unquestionably many of the difficulties and inconsistencies under which the municipal machinery is being operated are chargeable to the present charter and many of the ordinances, which admit of such wide latitude of responsibility as to make every official's business no official's business.

"The peculiar needs of our city can not be found in whole within the scope of a charter executed so many years ago, and the wisdom of adapting some of the ordinances to the changed conditions of the present time is certainly unquestionable."

"I thoroughly approve the facts as presented in the foregoing quotation from an inaugural address of my predecessor. It is oftentimes stated and generally conceded that the authority of your executive is so limited as to make him a figurehead in the transaction and administration of the city's affairs."

Passaic Valley Main Drainage

At a meeting of the Newark, N. J., Board of Trade on January 10, a report of the Committee on River Pollution referred to the bill now being prepared for overcoming the existing legal obligation, on the ground of unconstitutionality, to that part of the Passaic Valley District Pollution Act relating to the assessment and raising of money. The passage of such a bill is an indispensable preliminary to the full discussion, on its merits, of the project for draining Paterson, Newark and other cities in the valley by a trunk sewer, discharging in the lower bay. The report stated that there are good grounds for believing that Governor Stokes will favor this relief.

State Sanitation in Michigan

THE activity of the Michigan State Board of Health is typified by the report of proceedings at its last regular meeting, held on January 12. It was decided to coöperate with Prof. Delos Fall, of Albion College (a former member of the Board) in researches out of which it is hoped that a definite chlorine standard for pure water may be evolved. A special committee was appointed to coöperate with similar committees from the State Engineering Society and the State Medical Society in regard to legislation concerning public water supplies. Methods of disinfection are to be explained in a popular pamphlet, and other publications of the Board are to appear in the official organ, to be known in future as "Public Health, Michigan."

"A SHAMELESS STEAL"

THE following letter, addressed to Mayor McClellan of New York by the City Club, and the illustrations with which we have been favored by that body, call for little in the way of explanation or comment until such time as action is taken on the representations made. It is quite possible that New York's transit facilities would be greatly improved by the additional track, of which notice is taken by the Club, and it may even be that the refusal to sanction its construction may be connected with the Company's failure to observe certain customs—too well known to need characterization—tending to the avoidance of a "hold-up." But respect for the law, even as administered in some of America's worst governed cities, demands that proceedings of this high-handed character shall receive effective attention at the hands of public-spirited associations and individuals, and the City Club's action is eminently adapted to meet the requirement.

New York, Jan. 22, 1906.

HON. GEORGE B. MCCLELLAN,
Mayor, City of New York,
City Hall.

SIR:

I write you on behalf of the Trustees of the City Club, to call your attention to the fact that, at the present time, the Interborough Railroad Company is, in direct violation of law, without the consent of the local authorities and without having secured a franchise from the city, deliberately constructing an additional third track at various points on the Third Avenue Elevated line. I submit herewith, for your consideration, two affidavits and four photographs showing the nature of the construction that is proceeding on this road between 44th and 53d streets.

No more shameless attempt to steal a franchise of great value and to deprive the people of their rights has probably ever been perpetrated in the City of New York.

The efforts of this corporation are particularly flagrant, because of the fact that on May 31, 1905, it made appli-

cation to the Rapid Transit Commission for a franchise for the construction of this third track on the Third Avenue line, which, after full discussion and a public hearing, was denied.

This corporation now proceeds to take by force that which the city, through its appropriate authorities, has refused to permit it to have, even with compensation.

It is not surprising that this corporation should have taken this course of action in view of the fact that the same interests, four months ago, proceeded to take by force, in a similar manner, a franchise possibly of even greater value, involved in the construction of the so-called "Steinway Tunnel" from Long Island City, under 42d street. Notwithstanding the fact that your attention was called by the City Club to this unlawful invasion of the city's rights on September 15, 1905—over four months ago—and again on November 27, 1905, nothing whatever has been done by the city (beyond the revocation of a permit and reference to the Corporation Counsel's office of this matter) to stop the progress of this unlawful work, even though there have been two serious accidents in this tunnel, indicating that the work has been progressing with all speed.

It is inconceivable that the City of New York should be helpless to protect its franchise rights. If it is without power to stop these thefts, I submit that it is your duty, as Mayor of the city, at once to request the Legislature to give such power to the local authorities as will prevent these practices. If, however, your administration has the power, it is plainly your duty immediately to take such action as will prevent the further progress of work upon the Third Avenue Elevated Road and the Steinway Tunnel. If you desire these operations stopped there is, in our opinion, nothing to prevent your stopping them immediately.

Yours respectfully,

LAWRENCE VEILLER,
Secretary, City Club



"A SHAMELESS STEAL."—FORTY-SEVENTH STREET STATION; NEW TIES READY FOR THIRD TRACK

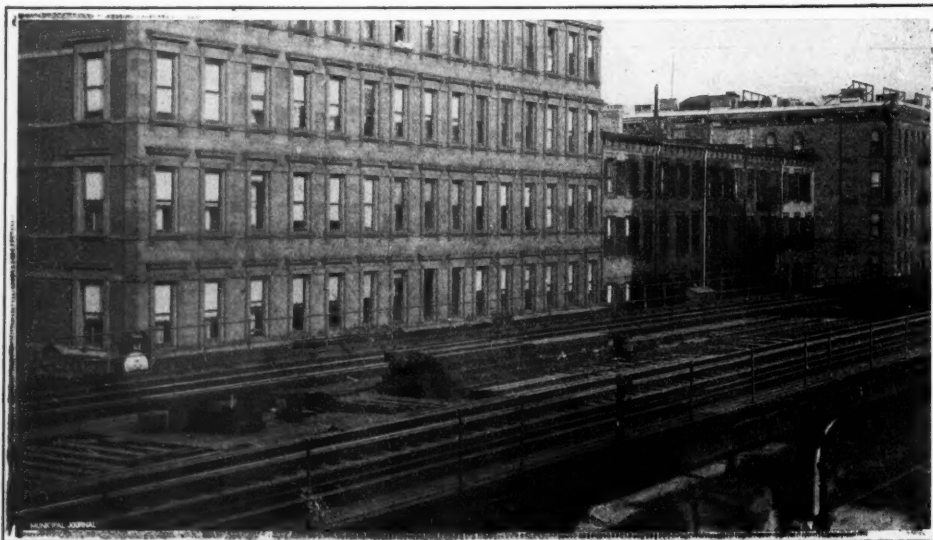
"Freak" Advertising

WE welcome the following utterance of Mayor Henry M. Doremus, of Newark, N. J., being part of his fourth annual message to the Common Council of that city, and heartily commend it to the attention of civic bodies generally:—

"During the last few years the evil practises of freak advertisers have grown almost beyond control. That a man in costume not usually worn has no right to exhibit himself as a trained freak in the interests of some advertiser and by his action endanger the life and limb of pedestrians no one will dispute. That an immense wagon with canvas top and sides concealing men and boys paid to beat drums and make other noises to attract attention is annoying, is self-evident.

"That strangers in our city should find our busiest corners reeking with flamboyant billboards, sends a chill of shame down the spine of every Newark-loving Newarker. All these advertising schemes are an injustice to individuals and an imposition on the public. Taxes are levied for the beautifying of streets, parks and public property generally, and the billboard and freak advertising novelties are an offset to such taxation. I do not believe that billboard advertising is any longer essential to business increase. In fact I am informed that the larger and more legitimate business men of Newark have practically discarded this form of advertising.

"I am not in favor of permitting the continuance of this evil by merely exacting a license fee and thus condoning the harm done. Nor am I in favor of the enactment of any ordinance forbidding Newark merchants from advertising in any form that suits them best, remembering always that a nuisance or an infringement of the liberty of others may be proceeded against legally. My object in alluding to this subject is to appeal, through you, to the merchants of Newark to refrain from freak advertising, and to appeal through you to property owners to refrain from granting locations for unsightly billboards."



"A SHAMELESS STEAL."—THIRD AVENUE AND FORTY-NINTH STREET: MATERIAL FOR CONTINUATION OF THIRD TRACK LAYING.

Sale of Municipal Bonds

THE experience of Boston, in failing to place 3½ per cent. bonds, to the value of \$2,416,000, in the usual way, has directed attention to the adopted alternative of selling municipal stock "over the counter." The stringent conditions which oppressed the money market when it was attempted to place the issue upon it sufficed to prevent the sale, but this did not serve as a bar when the City Treasurer offered the bonds to citizens in amounts of not less than \$1,000. The result justified the means, for the amount has been over subscribed, and there is an opportunity for the city authorities, by giving preference to the smaller bidders, to realize a condition often advocated, but seldom attained, in which a large number of taxpayers are personally interested in their city's finances.

Boston's position is by no means unique. The difficulty of finding mortgage investments of small amount has led to a large increase in the purchase of the city's bonds by Milwaukee citizens who have savings at their disposal.

Commenting on this feature, Mr. Oliver C. Fuller, President of the Wisconsin Trust Company, recently stated that "with every year the people are becoming better acquainted with the nature and character of bonds, their safety and stability, and more such investments are being made. High class bond houses throughout the country have more individual clients to-day, as a rule, than they had a year ago, and that is particularly true of Milwaukee. The local real estate investment situation is one cause of this condition of affairs. It has become exceedingly difficult to invest in small mortgages. The man with large sums of money to loan has not so much trouble in placing his money in first-class mortgages provided he is satisfied with a low rate of interest. Not so the man of smaller means. He is forced to place his money on outlying property, the value of which has as yet not been definitely determined. If he is shrewd and circumspect, and most men who have saved from

their earnings are, he will prefer to invest his surplus in bonds whose value is easily ascertainable and quickly realized, than in doubtful mortgages. Bonds, secured by first mortgage on property of public service corporations or guaranteed by the taxes of a community when properly and legally issued, are generally satisfactory investments. Their value is stable."

A similar experience has been gained in some Canadian cities, notably in Galt, Ont., where \$24,000, out of a total issue of \$50,000, was absorbed by investing townspeople, the remainder being provided for by the city's sinking fund.

Standards for Hard Water*

DURING the last few years several new analytical methods have been introduced for determining the hardness of water and for differentiating the various hardening constituents, and the analysis of water for industrial purposes and for use in connection with water softening is not now as difficult or as laborious as was formerly the case.

For accurate work on hard waters the old soap method is being superseded by the new soda-reagent method. This and the volumetric methods for determining the magnesia, the alkalinity and the free carbonic acid, give practically all the data required.

A simple and accurate method for determining the calcium volumetrically, using the natural water without preliminary separations, remains to be discovered.

These new methods are described in detail in the report of the Committee on Standard Methods of Water Analysis of the American Public Health Association, published last year, this being to-day the most complete text-book of methods of water analysis.

The lecturer illustrated the various methods described, using a specially devised table illuminated from beneath, so arranged that, by means of a mirror placed behind it, the operations were visible to the entire audience.

Speaking of the character of the hardening constituents in water, the following types were referred to:—

1. Chlorinated or muriatic waters.
2. Carbonated waters.
3. Sulphated waters.
4. Sulphuretted waters.
5. Ferruginous, or chalybeate waters.
6. Acid waters.
7. Alkaline waters.

These waters are variously located, and their geographical distribution depends upon the geological formations. In Eastern New England the waters are generally soft; between the Berkshires and the Hudson River they are hard; in the Catskill region they are soft; in the Middle States they are hard; in the Northwest they are soft again. It is interesting to note the constant increase in the hardness of the water as it flows through the Great Lakes from Lake Superior to Lake Ontario.

The oil wells of Ohio have a marked effect on the hardness and chlorine in Lake Erie water. The water pumped from the oil wells, being heavily charged with salt, not only makes some of the Ohio streams brackish but materially increases the chlorine in Lake Erie between Detroit and Cleveland. Indeed, by studying the chlorine contents of the waters much could be learned about the currents in the western part of the lake.

THE SMOKE NUISANCE IN WASHINGTON, D. C., is still the subject of strenuous complaint, railroad locomotives being the offenders charged.

* Abstract of the third in a series of six lectures on "The Industrial Uses of Water," now being given, on Tuesday evenings, before the Polytechnic Institute of Brooklyn, by Consulting Professor George C. Whipple, of the Department of Chemistry.—Lecture of January 23.

Municipal Motor Cars

THE day is apparently past when the application of power to road vehicles is confined to purposes of pleasure. It is long since the convenience of this method of propulsion was recognized by business firms, whose delivery vans are conspicuous on the streets of most large cities, and the example thus set bids fair to be widely followed by the city authorities themselves. New York, for instance, has now in use or on order fourteen motor carriages of the type described as "chief's buggy" by the makers, the Baker Motor-Vehicle Company, of Cleveland, Ohio. These are capable of attaining a 30-mile gait in emergencies and are found eminently satisfactory in other respects. One of these cars attracted much attention at the Automobile Exhibition in the Armory, New York.

A recent number of THE MOTOR WAY illustrates the Kern electric street sweeper, invented by Bernard Kern, Jr., of Toledo, the first of which was placed on the streets of Fremont, Ohio, in August last. This is driven by a 5 h. p. electric motor, a separate motor, of half that capacity, operating the sweeper proper. The revolving broom agitates the dirt and dust of the street, which is then sucked up by a fan, through a conduit into a dirt receptacle at the rear. In the smaller machine illustrated, this box holds four cubic yards. The broom, forty inches long, is placed at right-angles to the car, the claim being made that better work is thus accomplished than if placed diagonally. An estimate by our contemporary, based on the invention's application to street cleaning in Toledo, results in the conclusion that the work could be done for one-twelfth of the cost of the present system.

Government departments are also becoming interested in the possibilities of motor traction. A contract recently let by the U. S. Postmaster General, for the conveyance of mails between Roswell and Torrence, N. M., a distance of 111 miles, will be carried out by three Roswell automobile cars purchased for that purpose. The contract extends from the first of this year to June 30, 1910.

A REALLY NOVEL PAVEMENT is referred to in a recent issue of the (London) *Sanitary Record* as evidencing an unsuspected progressiveness in an African tribe. While municipal authorities are deciding upon the relative value of asphalt, Belgian blocks, vitrified bricks, and wood squares as paving material, the inhabitants of Gwandu, in Africa, have settled the problem to their entire satisfaction by using the skulls of their enemies for paving the approaches of their town. "More than twelve thousand skulls are used in paving the approaches to the various gates, and to those who do not know what material is used, these gleaming skulls, polished to whiteness by the attrition of countless feet, form an ivory-like approach of no small attractiveness. When a new pavement is needed there is no scandal about the letting of the paving contract. War is declared upon some neighboring tribe, and presently the worn-out pavement is replaced by a new one at a small cost. Life is cheap in the African interior."

Almost Incredible

A BULLETIN issued by the Citizens' Association of Chicago, on January 15, refers to the action taken by that body, four years ago, in calling attention to the bridge-tenders' pay-roll as an example of municipal extravagance. It was then shown that "saloon keepers and politicians who were carried on the city pay-roll as bridge tenders, employed substitutes to do their work and thereby made a large profit out of the salary; that others received for their own service twice what they paid for similar services to assistants; while still others were paid to turn bridges that had been out of use for years."

A horizontal reduction of 10 per cent., amounting to \$7,772, in the bridge tenders' appropriation for the following year was obviously but a partial remedy for these conditions. The present Bulletin shows that "conditions are almost as bad as they were four years ago," and illustrates this statement by concrete examples. We note, among these, that one bridge tender has for some months been running a saloon owned by an aldermanic brother; this sinecurist claims that he pays night man at bridge \$65 and day man \$60 a month, thus making a profit of \$100 per month without doing a stroke for the city himself. There are many cases differing only in degree from this; also others in which, while the incumbents work, they "receive in most instances for their own services twice what they pay to others for the same service." As one result of this system, "the elaborate machinery of a number of these great bridges, costing from \$200,000 to \$300,000 each, is at the mercy of underpaid and unfit men, who generally have no knowledge of mechanics."

A New Municipal Organization

We published in *"The Municipal News"* of December 13th—immediately following the transfer of that publication and pending arrangements for the weekly issue of THE MUNICIPAL JOURNAL AND ENGINEER—an article by Prof. Edward W. Bemis, of Cleveland, Ohio, in which the proceedings at a meeting of Ohio Mayors in that city were detailed and commented on. We now learn, through the courtesy of Mayor W. E. Kilpatrick, of Warren, that the organization then discussed has been placed on a permanent basis, with Mayor Frank L. Baldwin of Youngstown as President and Mr. Kilpatrick himself as Secretary. The Legislative Committee, whose special function it is to take up the Ohio Municipal Code and suggest changes, reported at an adjourned meeting held in the Columbus Council Chamber, January 9. The changes proposed were adopted by the assembled Mayors and will be introduced into the Legislature for enactment. The new body is to be known as the Association of Mayors of Ohio Municipalities, and the following members constitute the Legislative Committee:— Mayor Frank L. Baldwin, Youngstown, Chairman Ex-Officio; Mayor C. W. Kempel, Akron, Secretary; Mayor I. N. Zearing, Bellefontaine; Mayor E. J. Dempsey, Cincinnati; Mayor Tom L. Johnson, Cleveland; Mayor W. U. Blake, East Liverpool, and Mayor Brand Whitlock, Toledo.

An Important Decision

MAYOR DAVID P. JONES of Minneapolis has been sustained by the District Court of Hennepin county in his contention that he has the power of veto where contracts are awarded by motion instead of by resolution of the City Council. The suit arose from the Lighting Company having secured an alternative writ of mandamus compelling the Mayor to affix his signature to a street lighting contract recently let by a motion of the City Council.

In his memorandum, the District Judge states that the sole question involved was the proper construction of the provisions of the city charter creating, regulating and controlling the duties and powers of the City Council and the Mayor.

He cites at length the provisions of the charter and interprets them in the light of the facts and the law as laid down in this and other States. In concluding, the court says: "It is manifestly the duty of the court to avoid a construction which would be wholly subversive of public interests, unless the construction is imperatively demanded by the language of the law, and in this case I am of the opinion that it is not. For the reasons above given I am of the opinion that the contract of the relator did not become a binding contract upon the city and could not so become until, in the language of the charter, the City Council has acted thereon by ordinance or resolution, and such ordinance or resolution has been submitted the defendant for his approval."

Mayor Jones, in discussing this decision, recites the reasons which induced him to regard the proposed contract as inimical to the city's interests. Mr. Charles M. Patterson, President of the Lighting Company, has announced that he will take the case into the Supreme Court of the State. The appeal will be submitted upon briefs and a decision is expected by the first of March.

PROPERTY OWNERS IN ST. PAUL who decline to meet an assessment for public improvements on the ground of error will not be able to evade payment, the Supreme Court of Minnesota having recently held that where a mistake has been made in the original assessment the Board of Public Works has the power to rectify it by a re-assessment. While the city charter contains ample provisions to protect property owners and give them relief from assessments improperly made in the first place, it also confers on the Board of Public Works power to make a re-assessment which shall be valid no matter what the original circumstances may have been. The Supreme Court's decision declares that the courts can give no relief from this situation. The only relief lies in changing the charter.

AN INTERNATIONAL MUNICIPAL CONGRESS, limited to representatives of capitals having over 500,000 population, is proposed by Sir Edwin Cornwall, Chairman of the London County Council. Sir Edwin thinks that the meetings might be held annually and suggests, in connection therewith, an exchange of pupils between the schools of the respective cities.

CITY BREVITIES

GREENVILLE, TEX., is to have its business streets paved with vitrified bricks.

PORTSMOUTH, VA., is discussing the financial aspect of an annexation project.

SEATTLE, WASH., has appropriated \$75,000 for a new ornamental standpipe in Volunteer Park.

BALTIMORE, MD., is to have a new 250-million-gallon reservoir for a high-level district now served by standpipes.

JOLIET, ILL., has adopted an ordinance providing for the elevation of railroad tracks and passing through the city at grade.

SAN JOSE, CAL., will open its new Hall of Justice in February. The accommodations provided are exceptionally complete.

BINGHAMTON, N. Y., is discussing a proposal to give up asphalt streets and to repair defective asphalt by surfacing with brick.

ST. PAUL, MINN., is declared by a representative of the *Kansas City Star* to be without graft or scandal in its civic administration.

NIAGARA FALLS, N. Y., may be sued by relatives of typhoid fever victims, who allege neglect in regard to the provision of potable water.

NEWARK, N. J., is bringing suit against the Barber Asphalt Paving Company to enforce the "repairs" clause in regard to brick paving in Mt. Pleasant avenue.

PASADENA, CAL., proposes to put in operation the "recall" provision of its celebrated charter; if 25 per cent. of the registered voters sign the petition, Mayor Waterhouse "must go."

BUFFALO, N. Y., in the hands of its newly inducted Mayor Adams, is undergoing a thorough probing as regards official laxity, pecuniary affairs, in particular, being closely investigated.

SPOKANE, WASH., has a Municipal Ownership League, with ex-Mayor Dr. P. S. Byrne as President. Pending the acquisition of the street railways, a more strict regulation of franchises is urged.

PORTLAND, ORE., has granted a franchise for a street railway line, reserving rights of user for other roads, for reasonable consideration, and power of future purchase by the city for the original cost.

CLEVELAND, OHIO, has a Board of Health regulation to meet overcrowding in street cars; Mayor Johnson has no faith in its efficacy, believing that public opinion will not support it. The remedy lies in more equipment.

KANSAS CITY, KAS., will consider Mayor Rose's plan to secure municipal ownership of the water works. Thirty-year certificates would be issued, the interest, not exceeding 6 per cent., being payable solely out of water revenues.

Street Cleaning by Pressure Machines

SINCE the appearance of data on this subject in THE MUNICIPAL JOURNAL AND ENGINEER of January 10 (page 52) the following reply has been received from Mr. A. L. Walters, Superintendent, Department of Streets and Sewers, Seattle, Wash.:

We have been operating three machines of the type known as the "Sanitary" street flushing and sprinkling machine, made in St. Louis. These machines have been in use for about ten months, and I consider this to be the only sanitary way to clean asphalt streets, as they remove all the mud in winter and the dust in summer, which cannot be wholly removed with street sweepers.

Since we have been cleaning the residential districts with these machines, we have had no complaints. We operate the machines over an area of twenty-two miles of paving, fifteen of which is asphalt and seven is brick. Twelve additional miles of asphalt pavement have been laid in the last year, and the department will buy two or three more machines soon. The city owns and operates its own water system; therefore, the item of water is not figured in the cost of cleaning streets.

I have not discovered any injury to the asphalt pavements by the use of these machines, and any pavement which would be injured by this mode of cleaning is not practical for city streets.

Minneapolis Water Works Data

THE annual report of Registrar Gray, dealing with last year's operation of the Minneapolis waterworks, is the most gratifying in the history of the Department. A saving of nearly \$20,000 has been effected in the running expenses, which, with an increase in receipts of about \$25,000, makes a cash increment of about \$45,000 to the credit of the Department.

Nearly twice as many meters—2,582 in all—were installed as in the previous year. The flat rate revenue is steadily falling off, the decrease in this service being more than made up by the increase in the income from the meter service. The increased use of meters carried with it a decrease in the total volume of water pumped during the year, entailing a saving to the city of \$17,493 in this respect. The per capita consumption, in 1905, was about 65 gallons, as compared with 77 gallons in 1904, due allowance being made for the growth of population.

A NEW METHOD IN CITY APPOINTMENTS has been adopted by the South St. Paul City Council. Thinking that the methods employed in awarding contracts for city work may be used to advantage in hiring city officials, the council has decided to advertise for bids for a city physician. This step is taken in the belief that it will do away with the possibility of favoritism. Heretofore, some friend of a councilman has usually received the appointment, but under the new method figures will be received from the physicians in the city and the berth will go to the lowest bidder. Whether any consideration has been given to the possible quality of service so paid for does not appear from the reports.

MUNICIPAL JOURNAL AND ENGINEER

Published every Wednesday by
THE MUNICIPAL PUBLISHING COMPANY
Flatiron Building, Madison Square,
NEW YORK CITY

Telephone, 6723 Gramercy, New York.

Entered at the New York Post Office as second-class matter.

TERMS OF SUBSCRIPTION, PAYABLE IN ADVANCE

United States and possessions, Canada, Mexico and Cuba, \$3.00 per year
All other countries, 4.00
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It is also desired that the facilities furnished by the reference library in this office should be widely known and freely used by those interested in municipal affairs. Visitors will be welcomed and provided with conveniences for search, and inquiries by mail will be promptly dealt with.

NEW YORK, JANUARY 31, 1906.

The Disposal of Municipal Waste

IN view of the growing importance of this subject in American centres of population, we have made arrangements with Mr. W. F. Morse, Member of the Boston Society of Civil Engineers, Sanitary Section, to contribute to THE MUNICIPAL JOURNAL AND ENGINEER a series of articles dealing with its history and present position. Mr. Morse's qualifications for the task he has undertaken are abundantly recognized in this country. His experience includes the installation of more than fifty refuse cremation furnaces, notably that awarded two grand prizes at the Columbia Exposition, Chicago, in 1893. The Boston refuse utilization station, which has been in successful operation for the last seven years, was erected from his design and under his supervision, and he has since been responsible for many other plants. The first article of the series will appear in our next issue. It is hoped that those of our readers who have experience and data available, or who become aware of points on which further enlightenment is desirable, will use our columns for that discussion and inquiry which are so helpful in the study of any topic.

The Chicago Situation

THE decision, arrived at by Chicago's City Council on January 18, to submit to the voters, in April, the issue of \$75,000,000 certificates for municipal street railway construction is a gratifying victory for Mayor Dunne and his supporters, all the more so because recent events have not pointed to this realization of the hopes ardently entertained by the friends of municipal action on these lines. In commenting upon the then situation in last November's issue of THE MUNICIPAL JOURNAL AND ENGINEER, (page 224) we referred more particularly to the new position assumed by the traction companies in offering, for a renewal of their franchises, terms which, liberal as they were in the light of earlier history, have since been

made still more favorable for the city. The concessions before us at that time of writing were, indeed, so radical an improvement on anything previously known in the diversified record of Chicago passenger transportation that what was stigmatized as a revolt against Mayor Dunne's extreme position quickly followed their publication. Matters have been in suspense since that time, with a strong tendency towards the acceptance of the companies' terms as modified by negotiation, and the present decision comes, therefore, as a surprise of no ordinary kind.

It transpired, and it is no more than natural that such a feeling should arise, that some of Mayor Dunne's most loyal adherents regret the sweeping character of a decision which, unless modified, will debar the citizens of Chicago from voting on the issue which has distracted the Council for many months. Only in this way, it is argued, can it be said that the people have decided a question of such present and prospective importance. Meanwhile, discussion as to the legality, or otherwise, of the ordinances now carried by the Mayor's re-united party is being vigorously carried on, "much cry and little wool" probably representing the outcome of it all. Mayor Dunne has the solid satisfaction of clinching his two earlier victories by a third, without which the former would have been so much Dead Sea fruit. In the first place, the passage of the Mueller law made it legally possible for the city to "construct, acquire, purchase, own and maintain railways" and provided financial ability to act thereon; then came the Mayor's triumphant election on the specific issue and, finally, what was done but a few days ago. The country is to be congratulated on the prospect of following that large-scale object lesson in municipal ownership and operation which has too long been among the things desired, with dwindling hopes of attainment, and it is mainly indebted therefor to the earnestness with which Mayor Dunne has pursued the course marked out by himself and an enormous majority of his constituents.

Cement Users' Association

THE second annual Convention of the National Association of Cement Users was held at Milwaukee, Wis., January 9-12, and easily broke the attendance record of the earlier gathering at Indianapolis. The success of the gathering is the more complete in view of the hitch which almost prevented the finding of a suitable building in the city after the destruction, by fire, of the Mechanics' Pavilion, originally selected for the Convention. At the last moment, the decision to transfer the location to Columbus was rescinded, although press notices of the change had been sent out, and the result fully justified the wisdom of holding on.

We hope, in future issues, to present a selection of the papers read, in so far as these bear upon the work mainly vital to our readers. Much attention was devoted to concrete block building, the latest application of cement to structural purposes, the discussions revealing wide differences of opinion in regard to the proper treatment of the material in this connection. The lack of building

regulations with special reference to block construction was commented on in one of the papers, while another, dealing with legislation concerning the use of cement in New York City, elicited several criticisms as to the alleged unfairness of the regulations in force.

Roads in France

A REPORT on this subject by U. S. Consul-General Robert P. Skinner, of Marseilles, written more than a year ago, has led to many inquiries in regard to dust preventives. Replying to these in the form of a further report, Mr. Skinner regards it as "distinctly unfortunate that in the United States so much stress is laid on the dust problem and so little on primary construction and preservation of roads, although it is obvious that a well-built and carefully preserved road is necessarily dustless. The makeshift whereby the common American dirt road is occasionally dosed with tar and greases of various kinds, on the assumption that the French method is being followed, merely defers the proper rebuilding of our highway system.

"It must be remembered that France is already endowed with good roads, and that whereas in the United States the automobile has come as an instrument to awaken interest in the subject of highway building, it is regarded by the French road engineer as a destructive agent of roads already good. Moving with great velocity and with closely adhering and sometimes metal-shod tires, the automobile scrapes the fine hard surfaces like a file, surfaces which would resist years of ordinary wagon traffic. To combat these destructive influences many of the French engineers employ the tarring process, which aids powerfully to prevent the disintegration caused by traffic, and which, unless arrested, makes the dust nuisance acute."

So far from hot tar applications being regarded, in France, as something peculiarly adapted to the patching up of inferior roads, Mr. Skinner records the prevailing conviction that they "are valuable in proportion to the excellence of the surfaces upon which they are laid. When well done, the tarring gives the effect of an asphalt pavement, and the foothold on a macadamized surface is of course much better than on asphalt. In my previous report mention was made of a city boulevard in Marseilles first macadamized and then tarred. The tar was by no means smeared over the surface like a coat of paint. The work was done in the midst of the dry season, after the road had been carefully swept, and the hot liquid was worked with stiff brushes into the road joints, penetrating to a considerable depth. The traffic over this boulevard is intense, and consists largely of automobiles moving at their highest speed. After two years' wear no more dust is observable than would be the case with an ordinary asphalt pavement receiving the traffic of innumerable unpaved streets. The surface is intact, and the sides, where washing generally occurs, look as fresh and clean after a rain as an asphalt pavement. It is doubtful whether anything short of a hard pavement can give permanent satisfaction in a large city, but if such work as was performed

in Marseilles could be undertaken in the open country the road surfaces so treated ought to last for years with reasonable attention."

Annual Installments to Contractors

AT a recent meeting of the Minneapolis City Paving Committee, it was decided to recommend the City Council to advertise for bids for the resurfacing of 110,000 square yards of asphalt paving, the successful bidder to receive payment for the work in ten annual installments, with interest at the rate of 5 per cent. per annum. This step is considered necessary because of the dilapidated condition of the downtown streets on the one hand and, on the other, the fact that the city has no money with which to replace the wornout pavement or even to resurface with asphalt on the existing concrete foundation. Were the city to undertake the replacing of these 110,000 square yards of asphalt with creosoted wooden blocks, as has been proposed, the expense entailed would preclude the possibility of any other paving being done in other portions of the city for a period of two years. The State Legislature does not meet until a year hence, so that relief, from that source, by means of a \$500,000 bond issue, is impossible. As many conventions are to be held in the city during the summer, when many thousands of visitors are expected, the merchants of the downtown district are extremely anxious that the thoroughfares in the central portions of town shall be in presentable condition.

THE BRITISH FIRE PREVENTION COMMITTEE, founded in 1897, has recently published further reports showing that tests of fire resisting materials and construction are being systematically carried on at the special testing station. This comprises a house standing in its own grounds, the latter being used for the erection of testing chambers and furnaces.

Details of tests Nos. 66 to 69 inclusive refer respectively to floors and a 2½-inch partition constructed by the National Fireproof Company, of Pittsburg, Pa., and two doors furnished by the Gilmour Door Company, Ltd., of Trenton, Canada. In the former case, the object was to determine the effect on the floor of a four-hours' fire, with a maximum temperature of 2,200 degrees F.; while other tests dealt with the action of a one-hour fire under conditions specified in advance. The partition, consisting of 2½-inch porous terra-cotta hollow tiles, plastered, was subjected to a temperature of 1980° F.

The thorough character of the investigations being conducted by the committee is apparent from a study of these reports, a noteworthy feature of their production being that the services of the members, even as regards out-of-pocket expenses, are entirely voluntary. Those interested in the subject of fire protection should place themselves in communication with the Committee, at 1 Waterloo place, London.

THOMASVILLE, GA., has passed an ordinance furnishing free lighting to the residences of aldermen during their terms of office.

THE WEEK'S CONTRACT NEWS

RELATING TO MUNICIPAL AND PUBLIC WORK—THE CONSTRUCTION FIELD—PROPOSALS AND CONTRACTS—
SEWERAGE AND WATER SUPPLY, STREET IMPROVEMENT AND LIGHTING—FIRE EQUIPMENT—
BUILDINGS

STREET IMPROVEMENTS

Little Rock, Ark.—Three miles of paving will be undertaken this spring. An ordinance before the City Council provides for expending \$170,000 in improving South Main street, Eighth to Twenty-third street; Fifteenth street, Main to Victory; Sixteenth street, Victory to Park avenue, and portions of Park avenue.

Little Rock, Ark.—Eugene Swain, Manager for the Fort Scott Stone and Construction Company, has been awarded the contract to pave twenty-four blocks with brick at \$75,000.

Pulaski Heights, Ark.—A paving district, to include twenty-five blocks, has been established; the streets will be paved, curbing set and concrete sidewalks laid.

Santa Ana, Cal.—The proposition to issue street improvement bonds was defeated.

Woodland, Cal.—The Board of Public Works is considering the improvement of many of the streets by paving and curbing.

Indianapolis, Ind.—Bids will be opened, February 5, for constructing a macadamized road, three miles long, in Washington township, a mile-and-a-half road in Salt Creek township, and a two-mile road in Clay township.—Frank E. Ryan, Auditor, Decatur County.

Indianapolis, Ind.—Bids will be opened, February 6, for constructing three miles of stone road in Sullivan County.—E. E. Russell, Auditor.

Valparaiso, Ind.—Bonds for \$68,000 will shortly be issued by Valparaiso and Center townships, to provide for constructing gravel roads.

Winnamac, Ind.—The Board of Commissioners of Pulaski County will open bids, February 6, for building and improving twelve miles of road in Franklin township.

Clinton, Ia.—Bids will be opened, February 7, for macadamizing certain streets.

Topeka, Kan.—The City Council is considering an ordinance for paving Kansas avenue with asphalt. Plans have been prepared.—S. A. Swendson, Chairman, Street Committee; James F. McCabe, City Engineer.

Covington, Ky.—Madison avenue will be paved with creosote block in the early spring.

Newport, Ky.—Eleventh street is to be paved with brick; cost, \$18,000.

New Orleans, La.—Bids will shortly be invited for paving Farmer avenue with brick.

New Orleans, La.—Bids will be opened,

February 8, for purchasing \$35,000 street improvement bonds.—Charles E. Wener, Secretary.

Baltimore, Md.—The City Council has determined upon paving Curtiss street.

New Bedford, Mass.—Eight grade crossings will be abolished at a cost of \$1,000,000 and sewers and streets will be changed by the city at a cost of \$65,000.—William F. Williams, City Engineer.

Traverse City, Mich.—A resolution has been approved for paving portions of Union street.—W. R. Caldwell, City Engineer.

Detroit, Mich.—A report to the City Council gives the cost of street paving work at \$2,000,000. Plans and specifications have been prepared.

Flint, Mich.—Bids will be opened, February 19, for laying 14,000 square yards of pavement, brick, bitulithic or sheet asphalt, and 12,000 feet of combination cement curb and gutter; also for macadam.—D. E. Newcombe, City Clerk.

Manistee, Mich.—The City Council has approved plans and specifications for paving River street, Spruce to Jones street; Smith street, River street to the Smith street bridge, and Maple and Washington streets. Proposals are asked, until March 1. Brick or bituminous macadam will be used.—William Wente, Mayor; C. A. Gnewuch, City Clerk; George B. Pike, City Surveyor; Alex C. Hornkohl, City Treasurer.

Crookston, Minn.—Bids will be opened, March 13, for paving Houston avenue from Ash street to Carman Bridge with asphalt.—J. E. Carroll, City Engineer.

Duluth, Minn.—Bids will shortly be invited for the following pavements:—Second street, from Sixth avenue, west, to Seventh avenue, east; cost, \$60,000 to \$100,000; Seventeenth avenue, from Superior street to London Road; cost, \$7,000 to \$9,000; Tenth avenue, from London Road to Fourth street; cost, \$12,000 to \$18,000.—Thos. F. McGilvray, City Engineer.

Minneapolis, Minn.—The city will shortly advertise for bids on all paving supplies needed during 1906, including sandstone, creosoted wooden blocks, cedar blocks, Portland cement, artificial and granite curbing, and sand.—Andrew Rinker, City Engineer.

Montpelier, Minn.—The City Engineer is preparing plans for road improvements.

Vicksburg, Miss.—The City Council has authorized the paving of several streets.

Vicksburg, Miss.—The paving of Washington street is being considered.

St. Joseph, Mo.—The Board of Public Works is considering the paving of several streets.—George F. Barnes, City Clerk.

Hoboken, N. J.—The improvement of Clinton and Adams streets by grading and paving has been decided upon.—R. T. Dana, Borough Engineer.

Attica, N. Y.—The Wyoming County Supervisors have called for plans and estimates for road improvement in the vicinity of Perry, Warsaw, Sheldon and Orangeville, New York, aggregating 24 miles of highway.

Buffalo, N. Y.—The ordinance for a \$212,000 bond issue for abolishing grade crossings, and for street improvements generally, has been recommended by the Finance Committee, City Council.

Canajoharie, N. Y.—The Board of Supervisors has approved a State road from the corporation line of Nelliston, easterly along the turnpike to Palatine Bridge, and from Palatine northerly to Stone Arabia Corners, about four miles; estimated cost, \$34,100.

Canajoharie, N. Y.—A State road will probably be built from Herkimer County line at East Creek to St. Johnsville, thence to the boundary between St. Johnsville and Palatine near Palatine Church, a distance of 5.62 miles; estimated cost, \$57,500.

Berea, Ohio.—Bids will shortly be invited for paving Noble road with brick, and macadamizing Caldwell avenue and Lee road; also for constructing sidewalks thereon.—William G. Phare, Clerk, Cleveland Heights Village.

Bellaire, Ohio.—Bonds will be issued for paving, including culverts, drains, and retaining walls on Twentieth street, Twenty-first street, Twenty-second street, Twenty-seventh street, Union street and Franklin street.—T. W. Althar, Clerk, City Council.

Cambridge, Ohio.—Twelve of the leading streets will be paved with asphalt and brick.—C. L. Blackburn, City Clerk.

Cincinnati, Ohio.—Bids will be opened, February 9, for crushed stone for Mt. Airy road.—C. C. Richardson, County Auditor.

Cleveland, Ohio.—The Ohio Engineering Company, Lorain, has secured the contract for paving Con Ridge road, to cost \$174,000.

Columbus, Ohio.—A bond issue is proposed, to provide for abolishing certain grade crossings. Preliminary plans are before the City Council.

Columbus, Ohio.—The Board of Trade Committee has had a bill prepared, provid-

ing \$200,000 for building and repairing pavements.

Dayton, Ohio.—Stewart street will be extended and a large number of alleys, etc., improved.

Delaware, Ohio.—Bids will shortly be asked for paving Sandusky street.—F. D. King, City Clerk.

Delaware, Ohio.—Bids will be opened, February 12, for furnishing labor and material for grading, macadamizing, guttering, curbing and underdraining High street, Oak street and Channing street.—F. D. King, Clerk, Board of Public Service.

Findlay, Ohio.—The City Council will consider paving Mechanic street at an early date.

Lorain, Ohio.—The City Council is considering the building of a subway at Tenth avenue; also paving Vine street.

Norwalk, Ohio.—Plans have been prepared for paving Newton street, Benedict avenue and East Main street.

Portsmouth, Ohio.—About 4,000 feet of Eighth street, Earlytown, will be paved; also Lawson street, East End.—Howard Harsha, Chairman.

Youngstown, Ohio.—West Federal street will be repaved, in the spring, by direction of the City Council.

Youngstown, Ohio.—Bids will be opened, February 10, for \$100,000 Mahoning County good road bonds.—North Newton, Secretary, Board of Commissioners for Good Roads.

Washington, Pa.—The County Commissioners are considering a three-mile road, in West Run township.—Henry Y. Lash, Chairman.

Dallas, Texas.—The City Council is considering plans and estimates for paving Elm and Judson streets.

Houston, Tex.—The Council has decided to pave Main street with brick.

Lockhart, Tex.—The citizens voted to issue \$5,000 street and improvement bonds.

Seattle, Wash.—Ordinances for street improvements have been passed, as follows: For concrete sidewalks, \$32,270; grading and paving, \$70,390; installing water mains, \$39,000.—R. H. Thomson, City Engineer; C. B. Bagley, Secretary, Board of Public Works.

SEWERS

Montgomery, Ala.—Bids for constructing a sanitary sewer in several streets will be opened February 5.—R. S. Williams.

Los Angeles, Cal.—The question of issuing \$300,000 bonds, for building a sewerage system, is under consideration.

Hartford, Conn.—An ordinance has been approved for building the New Britain Avenue sewer.—Frederick L. Ford, City Engineer.

Emmetsburg, Ill.—Bids are asked, until February 5, for constructing 4,300 feet of sewers.—P. H. Hand, City Clerk.

Durant, Ind. Ter.—The citizens will vote on issuing \$25,000 sewer bonds and \$16,000 school bonds.

Cedar Rapids, Iowa.—It is proposed to build certain sewers, for which plans have been prepared.—W. S. Cherry, Chairman, Improvement Committee, City Council.

Louisville, Ky.—Government engineers will prepare a topographical map of the city, preliminary to constructing a sewerage system.

Kansas City, Mo.—Plans for 6,000 feet of sewer, to replace a creek, now used as an open sewer, are being prepared by the City Engineer; estimated cost, \$14,000.

St. Louis, Mo.—Plans have been prepared for constructing the Harlan Creek sewer; estimated cost, \$225,000.

Omaha, Neb.—Plans for extensive improvements in the sewerage system are being prepared by the City Engineer's Department; cost, \$150,000.

Lestershire, N. Y.—The City Council is considering plans for a septic sewage system.

Akron, O.—The City Council has voted to build a sewer in Huron street. The Board of Public Service is preparing plans for a conduit along West Buchtel avenue.

Barberton, O.—A special assessment will be made for building a \$7,800 outlet for the main sanitary sewer.

Dayton, O.—The city will shortly issue \$27,000 paving and sewer bonds.

Elyria, Ohio.—A bond issue of \$5,000 for building sewers has been approved by the City Council.—Frank R. Fauver, City Auditor.

Galion, O.—The improvement of the mammoth ditch will be commenced as soon as the weather permits.—D. O. Castle, Mayor.

Hamilton, O.—An open ditch will be dug at Crawford Run, and a concrete and brick sewer will be built.

Springfield, Ohio.—The City Council is considering plans and specifications for sewers. No streets will be paved during the season on account of laying the new sewerage system.—W. H. Bryant, Chairman, Street Committee.

Youngstown, O.—The West Federal street sewer, which is being petitioned for, will cost \$7,600.—F. M. Lillie, City Engineer.

Zanesville, O.—Plans for the new conduit in the Muskeegum Valley, at Taylorsville, have been completed, and work will be commenced shortly.

Harrisburg, Pa.—It is proposed to issue \$200,000 bonds for sewers.

Philadelphia, Pa.—Proposals will be received, within two weeks, for building sewers in Market street between the City Hall and the Delaware river.

Marshall, Texas.—The State Attorney General has approved the proposed \$5,000 bond issue for constructing sewers.

Franklin, Va.—A \$40,000 bond issue will shortly be authorized for building sewers.—Charles S. York, Engineer.

La Crosse, Wis.—The City Council is arranging to provide sewerage systems for the suburbs.

WATER SUPPLY

San Francisco, Cal.—Bids will be opened, February 6, for the construction of a 100,000-gallon reinforced concrete reservoir at Fort Miley, Cal.—Colonel W. S. Patten, Assistant Quartermaster General, U. S. Army.

Albany, Ga.—The matter of improving the water-works is being discussed.

Atlanta, Ga.—Proposals will be received February 3, for extending and improving the water system at Fort Fremont, S. C.—Samuel R. Jones, Quartermaster, Fort Fremont.

Cochran, Ga.—Bids will be opened, February 6, for a water tower, fire pump, boiler, generator and engine for water and light plant.—Arthur Pew, Consulting Engineer; W. B. Denham, City Clerk.

Davis, Ind. Ty.—It is reported that the Secretary of the Interior has approved the proposed \$25,000 bond issue, for constructing water-works.

Rock Island, Ill.—Bids will be invited for constructing a \$7,000 addition to the water-works building.

La Fayette, La.—It is proposed to issue bonds for improving the water-works and enlarging the electric light plant.

Cambridge, Mass.—The city will construct a section of pipe line between Irving street, Watertown, and Newton street, Waltham, at an estimated cost of \$300,000.—C. H. Thurston, Mayor.

Grand Rapids, Mich.—The City Council has under consideration the issue of water works bonds.

Hastings, Mich.—The issuing of \$35,000 water bonds will be voted on at a special election, February 10.

Jackson, Mo.—Bids will be opened, February 19, for installing a complete water and lighting plant.—Hiram Phillips, St. Louis, Consulting Engineer; Edward D. Hays, Mayor.

Watervliet, Mich.—The building of a municipal water plant is being considered; the citizens will vote on issuing \$15,000 bonds at the spring election.

Vernon Center, Minn.—The citizens have voted to issue \$5,000 bonds for water-works.

Springfield, Mo.—The City Council is considering the issue of \$700,000 bonds for a municipal water-works.

Trenton, Mo.—A mass meeting of citizens resolved in favor of issuing \$80,000 bonds to install a new water plant.

Weston, Neb.—Bonds will be issued for improving the water system.

Atlantic City, N. J.—The Water Commission will expend \$100,000 for a concrete jacket around the 30-inch steel water main, from the mainland across the meadows, and \$500,000 for a reservoir.—J. W. Hackney, City Engineer.

Elyria, Ohio.—The City Council has authorized a \$15,000 bond issue for improving the water-works and for extending mains.—Frank R. Fauver, City Auditor; R. Moriarty, Deputy Clerk.

Wooster, O.—A \$60,000 bond issue is authorized for constructing and equipping a water-works plant, with a capacity of 4,000,000 gallons.—Councilman Schlossnogle, Chairman, Water and Light Committee.

Montreal, Que.—The city is considering an expenditure of \$1,000,000 for twenty-four inch high pressure fire mains.—John R. Barlow, City Engineer.

Bennettville, S. C.—The construction of water-works and a sewerage system is being considered.—Frederick Marshall, Abbeville, Engineer.

Knoxville, Tenn.—The citizens will vote on issuing bonds for improving the water system.

Seattle, Wash.—Bids for a steel stand-pipe and masonry casing at Volunteer Park, Seattle, Wash., will be opened by the Board of Public Works, February 3.—R. H. Thomson, City Engineer; C. B. Bagley, Secretary, Board of Public Works.

Seattle, Wash.—Proposals were opened, January 30, for constructing water mains; also laying pipes, along Sixth avenue west; estimated cost, \$13,100.—R. H. Thomson, City Engineer; C. B. Bagley, Secretary, Board of Public Works.

Manchester, Va.—The Assembly is considering the installation of a filtration plant, to cost \$20,000.—C. C. Jones, Chairman.

Wheeling, W. Va.—The Water Board recommends the purchase of a 20,000,000 gallon pump and the construction of a larger reservoir.—Wilson Hoge, City Engineer.

PUBLIC LIGHTING

Atkins, Ark.—A 20-year franchise for town lighting has been granted B. F. Hill. An electric light plant will be erected.

Albany, Ga.—Plans have been prepared for extending the local lighting system to the Arcadia suburban district.

Brookport, Ill.—The City Council is considering the construction of an electric light and water plant.

Jacksonville, Ill.—An \$18,000 electric lighting plant is to be built.—S. B. Stewart, City Clerk.

Kirkwood, Ill.—An election, February 17, will decide on a \$25,000 bond issue for an electric lighting plant.

Durant, Ind.—The City Council will shortly consider a petition of the Choctaw Oil & Gas Company, of Cherryvale, Kan., for a twenty-year lighting franchise.

Fort Wayne, Ind.—Mayor Hosey has ordered plans for the construction of a municipal lighting plant.

Monon, Ind.—A. A. Weis has petitioned for a franchise to establish an electric lighting plant.

Afton, Ia.—Bids will be received, until February 12, for an electric lighting plant.—E. A. Lee, Chairman, Lighting Committee.

Winnipeg, Man., Canada.—Proposals are asked, until February 11, for furnishing certain electric light supplies, including arc lamps.—F. A. Cambridge, City Electrician; C. J. Brown, City Clerk.

Vicksburg, Mich.—The City Council has granted John P. Snooks, Kalamazoo, Mich., a franchise for street lighting. A gas plant will shortly be erected.

Grand Island, Neb.—The citizens will vote, March 6, on issuing \$35,000 municipal light bonds.—Edward Hooper, City Clerk.

Cleveland, O.—A new municipal lighting plant building, costing \$40,000, will be erected, and \$16,000 will be expended on the existing plant.—W. J. Springborn, President, Board of Public Works.

Cleveland, O.—The Board of Public Service recommends the purchase of an engine and dynamo so that the city may light its own buildings and run elevators.

Columbus, O.—Bids will be opened, February 3, for the purchase of the old municipal lighting plant.—Charles H. Frank, Secretary, Board of Public Service.

Lima, O.—Bids will be opened, February 24, for installing a power plant for pumping purposes.—L. L. Crumrine, Clerk, Board of Public Service; J. K. Brice, City Engineer.

Cedar City, Utah.—A company has been organized to build an electric light plant.

Danville, Va.—The city will build purifier and retort house, and enlarge gas plant for a daily output of 200,000 cubic feet.—Frank Talbot, Superintendent and Treasurer.

FIRE DEPARTMENT SUPPLIES

Montgomery, Ala.—Bids will be opened, February 5, for purchasing a steam fire engine.—R. S. Williams.

Los Angeles, Cal.—The matter of erecting a fire engine house in the Arlington suburban district is being considered.

Fortuna, Cal.—The Fire Department recommends the purchase of another engine.

Austin, Ill.—The Cicero Town Trustees are considering the matter of a paid Fire Department.

Rock Island, Ill.—The city will shortly purchase a fire engine.

Burlington, Kan.—Additional hose is to be purchased for the Fire Department.

Crookston, Minn.—Bids for a hose wagon and a chemical engine will be opened February 27. Sanitary stalls will be put in Fire Department headquarters.

Elgin, Minn.—The question of purchasing fire equipment, including a hose cart, is being considered.

Grand Marris, Minn.—A Fire Department is to be organized and apparatus purchased.

Parker Prairie, Minn.—A Fire Company is being organized.

Vernon Center, Minn.—The City Council is preparing to establish fire protection.

Clinton, N. Y.—The Fire Department will shortly purchase new uniforms.

Cortland, N. Y.—The Fire Commissioners will purchase a hose and chemical wagon, and 800 feet of hose.

Rochester, N. Y.—A new fire engine is to be purchased for the central headquarters.

Elyria, O.—An \$8,000 bond issue has been recommended for purchasing fire apparatus.—Frank R. Fauver, Auditor.

Lorain, O.—Bids will shortly be invited for a large amount of additional fire equipment.—L. A. Dues, Secretary, Board of Public Service.

Zanesville, O.—A new engine house will shortly be erected; a new chemical engine is to be purchased.—W. H. Fairner, Fire Chief.

Chattanooga, Tenn.—The Board of Public Safety will overhaul the fire apparatus, install new plugs and improve the system generally.

San Antonio, Tex.—The Central Fire House is to be completed by Henry Kane for \$8,000.

PUBLIC BUILDINGS

Ontario, Cal.—The Town Trustees have authorized a special election to decide the question of issuing \$160,000 bonds for constructing school buildings.

Albany, Ga.—An election will be held, February 17, to decide the question of issuing \$20,000 bonds for reconstructing the Baker County Courthouse.

Elkhart, Ind.—The County Auditor has been authorized to sell \$25,000 County bonds to reconstruct the Court House.

Abilene, Kan.—Bonds are to be voted shortly for the improvement of schools.

Monroe, La.—A new City Hall, 286 ft. x 125 ft., will be built at a cost of \$100,000. Frank P. Milburn, Columbia, S. C., has plans.

Natchitoches, La.—Plans are being prepared for a new City Hall, Market House and City Jail; bids will be invited shortly.

Shreveport, La.—A new City Hall, to cost \$80,000, and a \$35,000 Market House are to be built on separate sites.

Grand Rapids, Mich.—The citizens will vote on issuing \$10,000 bonds for improving the county jail.

Waldon, Mich.—A \$7,000 bond issue will be made for erecting a school house.

Walnut Grove, Mo.—It is proposed to issue \$15,000 bonds for building a new school house.

Buffalo, N. Y.—Bids will be opened, February 8, for erecting a sixteen-room school building at Urban and Moselle streets.—Francis G. Ward, Commissioner of Public Works.

Dunkirk, N. Y.—The County will petition the Legislature for authority to issue school bonds.

Canton, O.—Bids will be opened, February 14, for \$3,900 four per cent. school bonds.—W. C. Lane, Clerk, Board of Education.

Lafayette, O.—Bonds, \$16,000, will be issued for a new school building.

Lima, O.—An issue of \$20,000 bonds is announced to build a twenty-room ward building; an additional \$20,000 issue will be made next year.

New Philadelphia, O.—The citizens will vote on issuing bonds for new school buildings.

Nottingham, O.—An issue of \$50,000 school bonds will probably be voted.

Zanesville, O.—Bids will be opened, February 24, for \$180,000 forty-year school bonds.

Millbank, S. D.—The School Board recommends a \$30,000 bond issue for constructing school buildings and repairing existing buildings.

MISCELLANEOUS

Tucson, Ariz.—Bids will shortly be invited for a double bridge at Fourth avenue and a single one at Fifth avenue. City Engineer Wright is preparing plans.

Ocean Park, Cal.—The city will sell \$10,000 bonds for a garbage crematory.

Bloomington, Ill.—The City Council has voted \$14,000 to establish a garbage crematory.—Elmer Folsom, City Engineer.

Chicago, Ill.—The matter of building a bridge over the south branch, Chicago river, at Ashland avenue and Thirty-ninth street, is under discussion. Preliminary plans are before the City Council.

La Porte, Ind.—Bids will be opened, February 5, for constructing a bridge at Fish Lake.—Charles H. Miller, City Auditor.

Jefferson, Iowa.—The Greene County Board of Supervisors will build a new bridge across the Coon River.

Sioux City, Iowa.—The City Council is considering the conversion of Perry Creek into a conduit; estimated cost, \$250,000.

St. Boniface, Man.—A new bridge will probably be built across the Seine River.

Muskegon, Mich.—A city committee recommended the improvement of Ryerson Creek and Giddings street and the construction of an iron bridge over Wood avenue.

Port Huron, Mich.—Proposals will shortly be asked for building a bridge over Block river at Military street, at an estimated cost of \$18,000.

Minneapolis, Minn.—Bids will be opened, February 19, for reflooring Bridge No. 261.—Hugh R. Scott, County Auditor.

Minneapolis, Minn.—The building of a bridge over Third avenue is being considered.

St. Joseph, Mo.—A bond issue for constructing the Wayne street steel viaduct is being considered in the City Council. A new bridge is also being discussed.

Wayne, Nebr.—Bids will be opened, February 20, for constructing bridges in

Wayne County during 1906.—Charles W. Reynolds, County Clerk.

Buffalo, N. Y.—Plans and specifications for a garbage destructor, to cost \$45,000, are being prepared.—Francis G. Ward, Commissioner of Public Works.

New York, N. Y.—Bids will be opened, February 6, for constructing a ventilating monitor for rubbish incinerator, and an extension of the plant.—M. Gibson, Deputy and Acting Commissioner of Street Cleaning.

Syracuse, N. Y.—A legislative bill provides \$27,000 as the State's share of the cost of replacing the old hoist bridge over the Oswego canal on North Salina street with a modern structure; estimated cost, \$50,000.

Cincinnati, Ohio.—The cost of the proposed Liberty street viaduct is estimated at \$32,500.—City Engineer Danenhower.

Colina, O.—The city will issue \$40,000 bonds to repair bridges.

Collingwood, O.—The village has applied to the Board of Education for permission to place \$90,000 bonds.

Toledo, O.—City Solicitor Northrup has recommended the issue of \$21,000 bonds to meet the city's indebtedness.

Toledo, Ohio.—An election may shortly be held to determine upon a bond issue for reconstructing the Cherry street bridge.

Warren, O.—The Board of Public Service has recommended the purchase of a large number of signs and numbers for the streets of the city.

Chandler, Okla.—Bids are asked by the County Clerk of Lincoln County, until February 3, for constructing a 60-foot span bridge.

Toronto, Ont., Canada.—The City Engineer will report upon the cost of building a bridge to connect Wellesley and Sparkhall streets, spanning the Don Valley. The cost will be \$150,000.

Chester, Pa.—A committee of the City Council will confer with officials of the Panhandle Railroad about constructing a steel viaduct over the First street crossing.

Chester, Pa.—The County Commissioners have authorized the building of a bridge at Morris Ferry, Tinicum Township, over Darby Creek.

West Newton, Pa.—The Westmoreland County Board recommends a new bridge across the Youghiogheny River, the old one having been condemned.

Manawa, Wis.—Bids will be opened, February 7, for building a two-arch concrete bridge across the Little Wolf river

at Little Wolf Mills.—Herman Lindov, Town Chairman.

Milwaukee, Wis.—The Board of Public Works is preparing plans for a new bridge over the North Menominee Canal, as part of the new Sixth street viaduct.

Milwaukee, Wis.—The City Council has instructed the City Engineer and the Building Inspector to prepare plans for a garbage plant, to be erected on the mainland near the harbor, at a cost of \$10,000.

TRACTION ENGINE FOR SALE

One 25 H. P. Traction Engine, with 30 H. P. Boiler, Reeves & Co. make; has only been used about two weeks; guaranteed as good as new; has smooth wheels instead of spur wheels. Will sell reasonable if sold at once, as we have absolutely no use for same. THE WADSWORTH STONE & PAVING CO., 405 Bessemer Building, Pittsburgh, Pa.

AGENTS WANTED

to solicit contracts for a street or road pavement possessing many advantages over present roads. New in this country, but successfully laid in Europe for the last thirty years. Address "Municipal," care of MUNICIPAL JOURNAL AND ENGINEER, New York.

Proposals

Water-Works and Electric Lights

COCHRAN, GA.
Sealed proposals will be received by the City of Cochran, Ga., until 2 o'clock P. M., February 6th, for Water Tower, Fire Pump, Boiler, Generator and Engine, for Water and Light Plant. For specifications, address W. B. Denham, City Clerk, Cochran, Ga.

ARTHUR PEW, Cons. Engr.

Sewerage System

MARION, MASS., Jan. 25, 1906.
Bids will be received at the office of the Selectmen of Marion, Massachusetts, until 8 o'clock P. M., Tuesday, February 13, 1906, for the following separate contracts:

I. Trenching and laying 17,500 feet of vitrified sewer pipe from 6 to 12 inch, with their appurtenances.

II. Building two small covered concrete reservoirs.

III. Building intermittent sand filter, total area one acre.

IV. Furnishing and erecting two sets of pumping machinery, each consisting of a small, vertical, submerged, centrifugal pump and a gasoline engine of about three horse power.

Plans and specifications can be seen at the office of W. A. Andrews, Marion, Mass., and at the office of the engineers, Freeman C. Coffin and Lewis D. Thorpe, 53 State St., Boston, Mass. The ground must be examined by the bidders. No plans or specifications will be sent by mail. The engineer will be on the ground to meet bidders February 13, 1906.

Proposal notices continued on following pages.

For PAVING, for ROOFING, for RESERVOIRS and all other purposes where a high grade asphaltum is desirable, use "MALTHA BRAND" 99% Bitumen

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Chicago San Francisco New York City

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Proposals

Sewerage System

MOHAWK, N. Y.
Sealed proposals will be received by the Municipal Board of the village of Mohawk, N. Y., until 12 o'clock, noon, on the 16th day of February, 1906, for the construction of about five and one-half miles of pipe sewers, with manholes and other accessories, including all material, tools and labor necessary to complete the same.

Bids will be received for the whole work only. Plans and profiles may be seen and specifications obtained at the office of the Municipal Commission. The Board hereby reserves and has the right to accept or reject any proposal, to contract with other than the lowest bidder, or to reject all proposals and advertise again, as in its judgment may be for the best interest of the village.

Bonds satisfactory to the Board in amount and sureties will be required of the one to whom the contract may be awarded. The sureties shall be residents of the State of New York or a Surety Company organized under the laws of and doing business in the State of New York, the latter preferred. Each bidder will state in his proposal the names and addresses of his bondsmen.

Cash, or a certified check, made payable to the order of the Treasurer of the Village of Mohawk, N. Y., to the amount of \$1,000, must be deposited by each bidder and accompany his bid as a guarantee that in case the contract is awarded to him he will, within seven days after notification of award, execute said contract.

Bids must be sealed and addressed to the Municipal Board, Mohawk, N. Y., and marked on the outside of the envelope enclosing them, "Proposals for Mohawk Sewers."

Dated, January 15, 1906.

D. C. FORD, President.
J. G. RICHARDSON,
CHARLES WALLACE,
FRED. B. CASEY,

Municipal Board.

KNIGHT & HOPKINS, Engineers, Rome, N. Y.

Tenders for Electric Generators

Sealed tenders addressed to Ald. J. C. Gibson, Chairman Fire, Water and Light Committee, for supply of two 500-H. P. Electric Generators, will be received at the office of the undersigned up to 3:30 P. M., on Monday, February 26th, 1906.

Specifications and forms of tender may be obtained on application to H. N. Ruttan, City Engineer, Winnipeg, Canada.

Each tender must be accompanied by an accepted cheque or draft payable to the order of the City Treasurer, or cash deposit for the sum called for in the form of tender supplied, which will be subject to forfeiture in case of failure on the part of the contractor to enter into a written contract, with approved sureties, if called upon to do so.

The city reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the City of Winnipeg.

C. J. BROWN, City Clerk.

City Clerk's Office,
Winnipeg, Man., Jan. 10, 1906.

Water-Works and Light Plant

JACKSON, Mo.
Sealed bids will be received by the City of Jackson, Missouri, until 8 P. M., Monday, February 19, 1906, for furnishing all materials, tools, and labor necessary to install a complete Water and Light Plant. Deposit required, five per cent. (5%) of bid.

Plans and specifications are on file with City Clerk of Jackson, Missouri, and Hiram Phillips, Consulting Engineer, No. 615 Frisco Bldg., St. Louis, Missouri, from whom contractors can obtain instructions to bidders and forms of proposals.

EDW. D. HAYES, Mayor,

Jackson, Mo.

JACKSON, MISSOURI, January 15, 1906.

Proposals for Constructing Sewers at Lexington, N. C.

Sealed proposals will be received by the Mayor and Board of Commissioners of the Town of Lexington, N. C., until 2 o'clock P. M., February 22, 1906, for constructing a Sewerage System in the Town of Lexington, N. C., and furnishing the materials for same.

Works will embrace approximately $5\frac{1}{2}$ miles of pipe sewers, from 8 to 15 inches in diameter.

Plans and specifications will be on file, and may be seen at the office of the Mayor, and copies of specifications, forms, etc., may be obtained from the Engineer.

The right is reserved to reject any or all bids.
JOHN H. MOYER, Mayor.
J. L. PEACOCK, Clerk.

Lexington, N. C.

Engineer: J. L. LUDLOW, Winston, N. C.

Proposal notices continued on following pages.

Leading Manufacturers

Of Supplies and Equipment for Municipal and Public Work

Brick, Paving, Building and Sewer.

W. H. Arthur, Stamford, Conn.
Barr Clay Co., Streator, Ill.
Bessemer Limestone Co., Youngstown, O.
Clearfield Clay Working Co., Clearfield, Pa.
Collinwood Shale Brick Co., Rose Bldg., Cleveland, Ohio.
Federal Clay Products Co., 232 5th Ave., Pittsburg, Pa.
Flint Brick & Coal Co., Des Moines, Ia.
McAvoy Vitrified Brick Co., Philadelphia, Pa.
Metropolitan Paving Brick Co., Canton, O.
New England Steam Brick Co., Providence, R. I.
Pittsburg-Buffalo Co., Frick Bldg., Pittsburg, Pa.
Purinton Paving Brick Co., Galesburg, Ill.
Suburban Brick Co., Wheeling, W. Va.
Texas & Pacific Coal Co., Fort Worth, Texas.
Western Brick Co., Danville, Ill.

Road Machinery, Rock Crushers, Etc.

Acme Road Machinery Co., Frankfort, N. Y.
Austin Mfg. Co., Chicago.
Buffalo Steam Roller Co., Buffalo, N. Y.
Climax Road Machine Co., Marathon, N. Y.
Erle Machine Shops, Erie, Pa. Asphalt Rollers.
Ke ly-Springfield Road Roller Co., Springfield, O.

Roofing and Roofing Material.

A. L. Barber Asphalt Co., 17 Battery Place, N. Y.
California Asphaltum Sales Agency, Mills Building, San Francisco, Cal.
Nashville Roofing & Paving Co., Nashville, Tenn.
Robt. A. Keasbey Co., 100 N. Moore St., N. Y.
Warren Bros. Co., Boston, Mass.
Warren Co., E. B., Washington, D. C.

Paving Materials (See also Brick).

A. L. Barber Asphalt Co., 17 Battery Place, N. Y.
Bevier Improved Wood Pavement Co., St. Paul Bldg., New York.
California Asphaltum Sales Agency, Mills Bldg., San Francisco, Cal.
Central Bitulithic Paving Co., Detroit, Mich.
Erimus Slag Paving Brick Co., 16 Exchange Pl., New York.
Globe Asphalt Co., 405 Bakewell Bldg., Pittsburg, Pa.
Southern Bitulithic Co., Nashville, Tenn.
Standard Bitulithic Co., 253 Broadway, N. Y.
U. S. Wood Preserving Co., 29 Broadway, N. Y.
Wadsworth Stone & Paving Co., Pittsburg, Pa.
Warren Brothers Co., Boston, Mass.
Warren Asphalt Paving Co., Cambridge, Mass.

Sewer Pipe.

East Ohio Sewer Pipe Co., Irondale, O.
Federal Clay Products Co., Pittsburg, Pa.
Great Northern Sewer Pipe Co., Empire, O.
Ohio River Sewer Pipe Co., Empire, O.
Pittsburg-Buffalo Co., Pittsburg, Pa.
Stratton Fire Clay Co., Empire, O.

Street Cleaning and Sprinkling Equipment.

Austin-Western Co., Chicago, Ill.
Etnyre, E. D., & Co., Oregon, Ill.
Sanitary Street Flushing Machine Co., St. Louis.
Strain, J. H., 12 Elm St., New York.
Studebaker Bros. Mfg. Co., South Bend, Ind.
Wirt & Knox Mfg. Co., 20 No. 4th St., Philadelphia, Pa.

Wagons and Carts.

Acme Road Machinery Co., Frankfort, N. Y.
Austin Mfg. Co., Chicago, Ill.
Climax Road Machine Co., Marathon, N. Y.

Fulton & Walker Co., Philadelphia, Pa.
Haywood Wagon Co., Baldwinsville, N. Y.
Hill Cart & Wagon Works, Jersey City, N. J.
Studebaker Bros. Mfg. Co., South Bend, Ind.
Tiffin Wagon Co., Tiffin, Ohio.
Troy Wagon Works Co., Troy, O.
Watson Wagon Co., Centre & Buck Sts., Canastota, N. Y.

Water-Works Equipment and Supplies.

Artesian Well & Supply Co., Providence, R. I.
Well Drilling.
Bethlehem Fdy. & Mach. Co., South Bethlehem, Pa. Pumping Machinery.
Buffalo Meter Co., Buffalo, N. Y. Meters.
Central Foundry Co., 116 N Nassau St., N. Y. Pipe.
Hersey Mfg. Co., So. Boston, Mass. Meters.
Jackson Filter Mfg. Co., St. Louis. Water Filters.
Luitweiler Pumping Engine Co., Los Angeles, Cal.
Mueller Mfg. Co., H., Decatur, Ill. Supplies.
Neptune Meter Co., New York. Meters.
Pittsburg Filter Mfg. Co., Pittsburg, Pa. Filters.
Pittsburg Meter Co., E. Pittsburg, Pa. Meters.
Rife Pumping Engine Co., 111 Broadway, N. Y.
John Simmons Co., N. Y. Supplies.
Union Water Meter Co., Worcester, Mass. Meters.
Washington Pipe & Foundry Co., Tacoma, Wash. Pipe, Hydrants, Valves.
Water-Works Equip. Co., 180 B'way, N. Y. Supplies.

Fire Extinguishing Equipment.

American-La France Fire Engine Co., Elmira, N. Y.
Eureka Fire Hose Co., 13 Barclay St., N. Y. Hose.
Fabric Fire Hose Co., Duane & Church Sts., N. Y.
Firestone Tire & Rubber Co., Akron, O. Rubber Tires.
Gamewell Fire Alarm Telegraph Co., N. Y. Alarm Systems.
Glazier Nozzle & Manufacturing Co., Indianapolis, Ind. Nozzles.
Seagrave Co., Columbus, O. Apparatus and Supplies.
Star Electric Co., Binghamton, N. Y. Alarm Systems.

Miscellaneous.

Balto. Enamel & Novelty Co., Baltimore, Md. Enamelled Signs.
Berger Mfg. Co., Canton, O. Everything in Sheet Steel. Metal Furniture.
Carson Trench Machine Co., Boston. Trench Machinery.
Cleveland St. Ltg. Co., Cleveland, O. Street Lamps.
Climax Supply Co., 712 Marquette Building, Chicago. Sign Posts.
Contractors Supply & Equipment Co., Chicago. Concrete Mixers, Contractors' Supplies.
Davison Foundry Co., 103-109 W. Monroe St., Chicago. Catch Basins.
Hetherington & Berner, Indianapolis. Asphalt Plants.
Marinette Gas Engine Co., Chicago Heights, Ill. Gas Engines.
John Maslin & Sons, Jersey City, N. J. Contractors' Pumps.
Okonite Co., Ltd., New York. Wire.
Pacific Flush Tank Co., Chicago. Flush Tanks.
Sanitary Engineering Co., 237 Broadway, N. Y. Garbage and Sewage Disposal.
Scherzer Rolling Lift Bridge Co., Chicago. Bridges.
Shields, W. S., 1715 Marquette Bldg., Chicago. Valves for Sewage Disposal Works.
Soltmann, E. G., 125 E. 42d St., N. Y. Drawing Materials.
Southern Creosoting Co., Slidell, La. Creosoted Wood.
Southern Exchange Co., N. Y. Poles.
Universal Safety Tread Co., 45 Broadway, N. Y.
Warner Co., Chas., Wilmington, Del. Cement.
Weber Steel Concrete Chimney Co., National Life Building, Chicago. Concrete Chimneys.

Proposals.

Medina Sandstone Blocks

LYNCHBURG, VA.
The City of Lynchburg, Virginia, contemplates paving some of its streets with Medina Sandstone Blocks, and desires approximate quotations on this material delivered f. o. b. cars Lynchburg, Virginia. Samples of the sandstone blocks should accompany the approximate quotation. It should also be stated the number of blocks required to make one square yard of completed pavement.

H. L. SHANER, City Engineer,
Lynchburg, Va.

Brick Sidewalk and Macadam Paving

ROANOKE, VA.
Bids are asked until February 10th, 1906, for constructing brick sidewalks and macadam pavements in the City of Roanoke, Va. A certificate

must accompany each bid for the amount specified under each nine sections (see specifications), and a guarantee bond in the sum of 50 per cent. of the contract price will be required of the successful contractor to guarantee the faithful performance of the contract. Plans and specifications can be obtained at the City Engineer's Office.

W. B. BATES, City Engineer.

Street Paving

INDEPENDENCE, KANS.
Sealed proposals will be received by the City Clerk of Independence, Kansas, up to three (3) o'clock P. M., of Tuesday, February thirteenth (13th), 1906, for the paving and curbing of Tenth street. Distance, 3,200 feet; width, thirty (30) feet; two courses of vitrified brick. Plans and specifications on file at office of City Clerk. Certified check for \$700 to accompany bid. The city reserves the right to reject any or all bids.

T. N. SICKLES, City Clerk.
JOS. S. BARNWELL, Engineer.

Power Plant

LIMA, OHIO.
Proposals for installation of power plant to actuate two 18-inch Centrifugal Pumps with a rated capacity of 500,000 gal. each per hour, will be received until noon, February 24, 1906, by the Board of Public Service, Lima, Ohio. Details will be furnished by the City Engineer.

Water-Works Supplies

DEQUEEN, ARK.
Bids will be opened February 15, 1906, by L. A. Pearre, at Dequeen, Ark., for the purchase of cast-iron water pipe, valves, pumps and boilers, necessary for the construction of a system of water-works.

Specifications and list of requirements may be had by addressing The O'Neil Engineering Company, Dallas, Texas. All rights reserved.

Sewers

CRESO, IOWA, Jan. 4, 1906.
Sealed proposals will be received at the City Clerk's office until 8 P. M., February 15, 1906, for the construction of two sewers, aggregate length 4,050 feet, with 8 manholes and 2 flush tanks. Estimated cost of sewers \$3,000. Sewers to be of 8-inch vitrified sewer pipe, with cemented joints, to be completed July 15, 1906.

Bids must be for the two sewers together. All bids must be addressed to the City Clerk and each bid must be accompanied, in a separate envelope, by a certified check of \$200, payable to the order of the City Treasurer.

Plans and specifications on file at the City Clerk's office.

W. L. RICHARDS,
Chairman Sewerage Committee.

Sewers

Bids wanted for furnishing all material and laying approximately 5,000 feet 6-inch pipe, 1,800 feet 10-inch pipe, 18 cast-iron manholes and 100 6-inch Y's, for the city of West Palm Beach, Fla. The right reserved to reject any or all bids. Address A. P. Anthony, West Palm Beach, Fla.

DENNISTON & CO.
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Rochester, N. Y.

JAMES A. HART COMPANY
General Contractors
Home Life Ins. Bldg., 256-7 Broadway, New York

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WHITMORE, RAUBER & VICINUS
Pavements, Sewers and General Contracting
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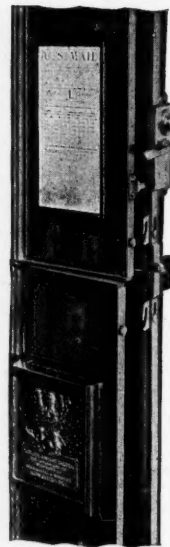
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STREET PAVEMENTS AND PAVING MATERIALS.—A Manual of City Pavements: the Methods and Materials of their Construction. For the Use of Students, Engineers, and City Officials. By Geo. W. Tillson, C. E. 8vo, xii + 532 pages, 60 figures. Cloth; \$4.00.

A TREATISE ON ROADS AND PAVEMENTS.—By Ira Osborn Baker, C. E. 8vo, viii + 655 pages, 171 figures, 68 tables. Cloth; \$5.00.

THE MODERN ASPHALT PAVEMENT.—By Clifford Richardson. 8vo, 560 pages. Cloth; \$3.00.

HIGHWAY CONSTRUCTION.—A Treatise on Highway Construction, Designed as a Text-book and Work of Reference for All Who May be Engaged in the Location, Construction, or Maintenance of Roads, Streets, and Pavements. By A. T. Byrne, C. E. Fourth Revised and Enlarged Edition. 8vo, xi + 895 pages, 306 illustrations. Cloth; \$5.00.

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SEWER DESIGN.—By H. N. Ogden, C. E., Asso. M. Am. Soc. C. E. 12mo, xi + 234 pages, 54 figures, 5 plates. Cloth; \$2.00.

SEWERAGE.—The Designing, Construction, and Maintenance of Sewerage Systems. By A. Prescott Folwell, M. Am. Soc. C. E. Fifth Edition, Revised and Enlarged. 8vo, x + 455 pages, illustrated. Cloth; \$3.00.

SEWERS AND DRAINS FOR POPULOUS DISTRICTS. With Rules and Formulae for the Determination of Their Dimensions Under all Circumstances.—By Julius W. Adams, C. E. One vol. 8vo, 228 pp., 84 illustrations and one folding map. Cloth; \$2.00.

PLAT AND PROFILE BOOK FOR CIVIL ENGINEERS AND CONTRACTORS. Containing 28 pages of Profile Paper and also handy tables for Excavation and Embankment, Strength of Materials, Size of Sewer for Various Slopes and Drainage Areas, and information for making Estimates in Electric Construction.—By H. F. Dunham. Flexible leather, oblong; 9 x 4 ins. \$1.00.

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